

REMARKS

Claims 13 and 37 are amended. Claims 3, 13 and 23-43 are pending in the application.

Claims 13, 31-33, 36-39 and 40-42 stand rejected under 35 U.S.C. § 102(b) as being anticipated individually by one or more of Arasawa (Re 36,810), Ohkase (US 5,536,918), and Osada (US 5,569,350). Claims 34-35, 40 and 43 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohkase individually and Osada individually or a combination of Arasawa and Ohkase. The Examiner is reminded by direction to MPEP § 2131 that anticipation requires each and every element of a claim to be disclosed in a single prior art reference. The Examiner is further reminded by direction to MPEP § 2143 that a proper obviousness rejection has the following three requirements: 1) there must be some suggestion or motivation to modify or combine reference teachings; 2) there must be a reasonable expectation of success; and 3) the combined references must teach or suggest all of the claim limitations. Claims 13 and 31-43 are allowable over Arasawa, Ohkase and Osada for at least the reason that the references, individually or in combination, fail to disclose or suggest each and every element in any of those claims.

As amended, independent claim 13 recites a susceptor for physically supporting a semiconductor substrate comprising a body with the front substrate receiving side face having a bearing surface to physically contact and support the semiconductor substrate. The body has a ring having a

radial inner portion at least a radial majority of which is non-solid space extending from the front side face to the back side face. The susceptor is configured such that the centermost portion of the semiconductor substrate does not contact the susceptor. Referring to Arasawa, such discloses a susceptor 14 with an electrostatic chuck 18 that is bonded to an upper portion of the susceptor (Fig. 6 and col. 4 and II. 27-30). The Examiner indicates reliance upon Arasawa as disclosing a body comprising a ring indicating reliance upon feature 22. However, applicant notes that feature 22 is a focus ring “arranged around the susceptor 14 to draw plasma generated to the semiconductor wafer W” (col. 4, II. 44-46) and is therefore not part of the susceptor. Accordingly, Arasawa does not disclose or suggest the claim 13 recited body comprising a ring having a radial inner portion at least a radial majority of which is non-solid space extending from the front side face to the back side face. Nor does Arasawa disclose or suggest the claim 13 recited susceptor being configured such that a centermost portion of the semiconductor substrate does not contact the susceptor.

Ohkase discloses a holder 3 having a central projection which contacts wafer 1 (Fig. 12). Ohkase therefore does not disclose or suggest the claim 13 recited susceptor being configured such that a centermost portion of the semiconductor substrate does not contact the susceptor. Referring to Osada initially at Fig. 1A, such discloses a susceptor having an inner portion 3 and an outer portion 9 where wafer 1 contacts inner portion

3. Referring next to Fig. 2, pins 2 are disclosed as lifting wafer 1 from the surface of portion 3 and as depicted in Fig. 3 and 4 entirely lifting wafer 1 from the susceptor. Applicant notes that in no instance does wafer 1 contact outer portion 9 of susceptor. Accordingly, Osada does not disclose or suggest the claim 13 recited body having a front substrate receiving side to physically contact and support the semiconductor substrate where the body comprises a ring and a radial inner portion at least a radial majority of which is non-solid space. Nor does Osada disclose or suggest the claim 13 recited susceptor being configured such that a centermost portion of the semiconductor substrate does not contact the susceptor.

When considered in combination, the teachings of Arasawa, Ohkase and Osada fail to disclose or suggest each and every element recited in claim 13. Specifically, such combination fails to disclose or suggest the claim 13 recited susceptor being configured such that a centermost portion of the semiconductor substrate does not contact the susceptor. Claim 13 is therefore not anticipated by, or rendered obvious by, Arasawa, Ohkase and Osada and is allowable over these references.

Dependent claims 31-36 are allowable over Arasawa, Ohkase and Osada for at least the reason that they depend from allowable base claim 3.

Referring to claim 37, such has been rewritten in independent form and is further amended. As amended, claim 37 recites a susceptor having a body with a front substrate receiving side face comprising a bearing surface to physically contact and support the semiconductor substrate, the body

comprising a ring and radial inner portion at least a radial majority of which is non-solid space. Claim 37 additionally recites that the susceptor comprises one or more extensions extending from the ring into the radial inner portion such that only a portion of the radial inner portion is non-solid space. Not one of Arasawa, Ohkase or Osada, or any combination thereof, disclose or suggest the claim 37 recited susceptor comprising one or more extensions extending from a ring into a radial inner portion such that only a portion of a radial inner portion is non-solid space. Accordingly, independent claim 37 is not anticipated by or rendered obvious by Arasawa, Ohkase and Osada and is allowable over these references.

Dependent claims 38-43 are allowable over Arasawa, Ohkase and Osada for at least the reason that they depend from allowable base claim 37.

Claims 3, 23 and 25-30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over various cited combinations of Wang (US 6,167,834), AmRhein (US 2003/0215963), Omstead (US 6,544,341) and Stone (US 2002/0066551). Independent claim 3 recites a substrate susceptor for receiving a semiconductor substrate to be deposited on by thermal deposition comprising susceptor back side radiant heating. The susceptor has a body having a front substrate receiving side, a back side and a peripheral edge, the body having multiple materials having at least two different thermal conductivities. An outer material is received across the back side and has a higher thermal conductivity than an immediately

adjacent material of the body, the outer material comprising at least one of polycrystalline diamond and copper. As acknowledged by the Examiner in the present Action, not one of Wang, AmRhein or Stone teach or suggest an outer material of copper or polycrystalline diamond. Omstead is relied upon for an outer copper material. However, as indicated in applicant's previous response, Omstead specifically teaches away from this recited feature.

One of the goals of the Omstead invention is to minimize or avoid copper deposition on the susceptor (col. 3, ll. 41-47; col. 4, ll. 22-25; col. 7, ll. 12-15; col. 8, ll. 48-55; col. 9, l. 42 through col. 10, l. 27; and Fig. 3). Accordingly, Omstead teaches away from copper on the susceptor. In response to the Applicant's indication regarding the teaching away by Omstead the Examiner indicates that Omstead was utilized as a "secondary art" reference. Regardless, since Omstead teaches away from depositing of copper on a susceptor, Omstead is unavailable for a basis of reliance for teaching regarding copper on a susceptor. Since the remaining art references (Wang, AmRhein and Stone) individually, or in combination, fail to disclose or suggest each and every element of claim 3, claim 3 is allowable over the art of record.

Dependent claims 23 and 25-30 are allowable over Wang, AmRhein, Omstead and Stone for at least the reason that they depend from allowable base claim 3.

Claim 24 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over a combination of Wang, AmRhein, Stone and Zimmer (US

6,054,183). As indicated above, independent claim 3 is not rendered obvious by the combination of Wang, AmRhein and Stone. The Examiner indicates that it's the Examiner's position that the diamond material is a residual coating resulting from deposition of a film on a wafer. However, in the case of the present application the Examiner is mistaken. As set forth at paragraphs 66-69, the diamond is specifically deposited according to the conditions set forth and confers specific advantages as described therein. Zimmer discloses utilizing CVD diamond to construct a polishing pad for planarizing or polishing semiconductor wafers. Nowhere does Zimmer disclose or suggest depositing, or any form or presence of, diamond upon a susceptor. Accordingly, such reference does not support the Examiner's position. Claim 3 is therefore allowable over the combination of Wang, AmRhein, Stone and Zimmer. Claim 24 is allowable over the combination of Wang, AmRhein, Stone and Zimmer for at least the reason that it depends from allowable base claim 3.

For the reasons discussed above, claims 3, 13 and 23-43 are allowable. Accordingly, applicant respectfully requests formal allowance of such claims in the Examiner's next action.

Respectfully submitted,

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